

ATC	ATC	AAC	CAC	TCT	TCA	CTC	TTC	AAC	TCT	CCT	CTC	TTG	GAT	ATC	TAT	CTC	TTC	ACC	ATG	60
																			Met	
																			1	
GTC	AAG	TTC	GCT	TCC	GTC	GTT	GCA	CTT	GTT	GCT	CCC	CTG	GCT	GCT	GCC	GCT	CCT	CAG	GAG	120
Val	Lys	Phe	Ala	Ser	Val	Val	Ala	Leu	Val	Ala	Pro	Leu	Ala	Ala	Ala	Ala	Pro	Gln	Glu	
																				20
																				15
																				10
ATC	CCC	AAC	ATT	GTT	GGT	GGC	ACT	TCT	GCC	AGC	GCT	GGC	GAC	TTC	CCC	TTC	ATC	GTG	AGC	180
Ile	Pro	Asn	Ile	Val	Gly	Gly	Thr	Ser	Ala	Ser	Ala	Gly	Asp	Phe	Pro	Phe	Ile	Val	Ser	
																				40
																				35
																				30
ATT	AGC	CGC	AAC	GGT	GGC	CCC	TGG	TGT	GGA	GGT	TCT	CTC	CTC	AAC	GCC	AAC	ACC	GTC	TTG	240
Ile	Ser	Arg	Asn	Gly	Gly	Pro	Trp	Cys	Gly	Gly	Ser	Leu	Leu	Asn	Ala	Asn	Thr	Val	Leu	
																				60
																				55
																				50
ACT	GCT	GCC	CAC	TGC	GTT	TCC	GGA	TAC	GCT	CAG	AGC	GGT	TTC	CAG	ATT	CGT	GCT	GGC	AGT	300
Thr	Ala	Ala	His	Cys	Val	Ser	Gly	Tyr	Ala	Gln	Ser	Gly	Phe	Gln	Ile	Arg	Ala	Gly	Ser	
																				80
																				75
																				70
CTG	TCT	CGC	ACT	TCT	GGT	GGT	ATT	ACC	TCC	TCG	CTT	TCC	TCC	GTC	AGA	GTT	CAC	CCT	AGC	360
Leu	Ser	Arg	Thr	Ser	Gly	Gly	Ile	Thr	Ser	Ser	Leu	Ser	Ser	Val	Arg	Val	His	Pro	Ser	
																				100
																				95
																				90
TAC	AGC	GGA	AAC	AAC	AAC	GAT	CTT	GCT	ATT	CTG	AAG	CTC	TCT	ACT	TCC	ATC	CCC	TCC	GGC	420
Tyr	Ser	Gly	Asn	Asn	Asn	Asp	Leu	Ala	Ile	Leu	Lys	Leu	Ser	Thr	Ser	Ile	Pro	Ser	Gly	
																				120
																				115
																				110
GGA	AAC	ATC	GGC	TAT	GCT	CGC	CTG	GCT	GCT	TCC	GGC	TCT	GAC	CCT	GTC	GCT	GGA	TCT	TCT	480
Gly	Asn	Ile	Gly	Tyr	Ala	Arg	Leu	Ala	Ala	Ser	Gly	Ser	Asp	Pro	Val	Ala	Gly	Ser	Ser	
																				140
																				135
																				130
																				125

Fig. 1A

GCC ACT GTT GCT GGC TGG GGC GCT ACC TCT GAG GGC GGC AGC TCT ACT CCC GTC AAC CTT 540
 Ala Thr Val Ala Gly Trp Gly Ala Thr Ser Ser Gly Ser Ser Thr Pro Val Asn Leu 145 150 155 160

 CTG AAG GTT ACT GTC CCT ATC GTC TCT GGT GCT ACC TGC CGA GCT CAG TAC GGC ACC TCC 600
 Leu Lys Val Thr Val Pro Ile Val Ser Arg Ala Thr Cys Arg Ala Gln Tyr Gly Thr Ser 165 170 175 180

 GCC ATC ACC AAC CAG ATG TTC TGT TGT GGT GGT TCT TCC GGT GGC AAG GAC TCT TGC CAG 660
 Ala Ile Thr Asn Gln Met Phe Cys Ala Gly Val Ser Ser Thr Ser Gly Gly Lys Asp Ser Cys Gln 185 190 195 200

 GGT GAC AGC GGC CCC ATC GTC GAC AGC TCC AAC ACT CTT ATC GGT GCT GTC TCT TGG 720
 Gly Asp Ser Gly Gly Pro Ile Val Asp Ser Ser Asn Thr Leu Ile Gly Ala Val Ser Trp 205 210 215 220

 GGT AAC GGA TGT GCC CGA CCC AAC TAC TCT GGT GTC TAT GCC AGC GTT GGT GCT CTC CGC 780
 Gly Asn Gly Cys Ala Arg Pro Asn Tyr Ser Gly Val Tyr Ala Ser Val Gly Ala Leu Arg 225 230 235 240

 TCT TTC ATT GAC ACC TAT GCT TAA ATA CCT TGT TGG AAG CGT CGA GAT GTT CCT TGA ATA 840
 Ser Phe Ile Asp Thr Tyr Ala

 TTC TCT AGC TTG AGT CTT GGA TAC GAA ACC TGT TTG AGA AAT AGG TTT CAA CGA GTT AAG 900

 AAG ATA TGA GTT GAT TTC AGT TGG ATC TTA GTC CTG GTT GCT CGT AAT AGA GCA ATC TAG 960

 ATA GCC CAA ATT GAA TAT GAA ATT TGA TGA AAA TAT TC 998

Fig. 1B

ATC ATC AAC CAC TCT TCA CTC TTC AAC TCT CCT CTC TTG GAT ATC TAT CTC TTC ACC ATG	60
Met	
1	
GTC AAG TTC GCT TCC GTC GTT GCA CTT GTT GCT CCC CTG GCT GCC GCT CCT CAG GAG	120
Val Lys Phe Ala Ser Val Val Ala Leu Val Ala Pro Leu Ala Ala Pro Gln Glu	
5 10 15 20	
ATC CCC AAC ATT GTT GGT GGC ACT TCT GCC AGC GCT GGT TTT CCC TTC ATC GTG AGC	180
Ile Pro Asn Ile Val Gly Gly Thr Ser Ala Ser Ala Gly Asp Phe Pro Phe Ile Val Ser	
25 30 35 40	
ATT AGC CGC AAC GGT GGC CCC TGG TGT GGA GGT TCT CTC CTC AAC GCC AAC ACC GTC TTG	240
Ile Ser Arg Asn Gly Gly Pro Trp Cys Gly Gly Ser Leu Leu Asn Thr Val Leu	
45 50 55 60	
ACT GCT GCC CAC TGC GTT TCC GGA TAC GCT CAG AGC GGT TTC CAG ATT CGT GCT GGC AGT	300
Thr Ala Ala His Cys Val Ser Gly Tyr Ala Gln Ser Gly Phe Gln Ile Arg Ala Gly Ser	
65 70 75 80	
CTG TCT CGC ACT TCT GGT GGT ATT ACC TCC TCG CTT TCC TCC GTC AGA GTT CAC CCT AGC	360
Leu Ser Arg Thr Ser Gly Gly Ile Thr Ser Ser Leu Ser Ser Val Arg Val His Pro Ser	
85 90 95 100	
TAC AGC GGA AAC AAC GAT CTT GCT ATT CTG AAG CTC TCT ACT TCC ATC CCC TCC GGC	420
Tyr Ser Gly Asn Asn Asp Leu Ala Ile Leu Lys Leu Ser Thr Ser Ile Pro Ser Gly	
105 110 115 120	
GGA AAC ATC GGC TAT GCT CGC CTG GCT GCT TCC GGC TCT GAC CCT GTC GCT GGA TCT TCT	480
Gly Asn Ile Gly Tyr Ala Arg Leu Ala Ala Ser Gly Ser Asp Pro Val Ala Gly Ser Ser	
125 130 135 140	

Fig. 2A

GCC ACT ACT GCT GGC TGG GGC GCT ACC TCT GAG GGC GGC AGC TCT ACT CCC GTC AAC CTT	540
Ala Thr Thr Ala Gly Trp Gly Ala Thr Ser Ser Ser Ser Thr Pro Val Asn Leu	
145 150 155 160	
CTG AAG GTT ACT GTC CCT ATC GTC TCT CGT GCT ACC TGC CGA GCT CAG TAC GGC ACC TCC	600
Leu Lys Val Thr Val Pro Ile Val Ser Arg Ala Thr Cys Arg Ala Gln Tyr Gly Thr Ser	
165 170 175 180	
GCC ATC ACC AAC CAG ATG TTC TGT GCT GGT GCT TCC GGT GGC TCT TCT TGC ATG GGT GAC	660
Ala Ile Thr Asn Gln Met Phe Cys Ala Gly Ala Ser Gly Ser Ser Cys Met Gly Asp	
185 190 195 200	
AGC GGC GGC CCC ATC GTC GAC TCC AAC ACT CTT ATC GGT ACT GTC TCT TGG GGT TCT	720
Ser Gly Gly Pro Ile Val Asp Ser Ser Asn Thr Leu Ile Gly Ile Val Ser Trp Gly Ser	
205 210 215 220	
GGA ACT TGT TCT ACT TCT ACT GTC TAT GCC AGC GGT GGT GCT CTC CGC TCT TTC	780
Gly Thr Cys Ser Thr Ser Thr Ser Thr Val Tyr Ala Ser Val Gly Ala Leu Arg Ser Phe	
225 230 235 240	
ATT GAC ACC TAT GCT TAA ATA CCT TGT TGG AAG CGT CGA GAT GTT CCT TGA ATA TTC TCT	840
Ile Asp Thr Tyr Ala	
245	
AGC TTG AGT CTT GGA TAC GAA ACC TGT TTG AGA AAT AGG TTT CAA CGA GTT AAG AAG ATA	900
TGA GTT GAT TTC AGT TGG ATC TTA GTC CTG GTT GCT CGT AAT AGA GCA ATC TAG ATA GCC	960
CAA ATT GAA TAT GAA ATT TGA TGA AAA TAT TC	992

Fig. 2B

<i>F. oxysporum</i> trypsin	I	V	G	G	T	S	A	S	A	G	D	F	P	F	I	V
<i>F. oxysporum</i> trypsin mutant	I	V	G	G	T	S	A	S	A	G	D	F	P	F	I	V
Bovine chymotrypsin A	I	V	N	G	E	E	A	V	P	G	S	W	P	W	Q	V
S	I	S	R	N	G	G	P	W	C	G	G	S	L	L	N	A
S	I	S	R	N	G	G	P	W	C	G	G	S	L	L	N	A
S	L	Q	D	K	T	G	F	H	F	C	G	G	S	L	I	N
S	L	-	-	-	S	R	T	S	G	G	I	T	S	S	L	S
S	L	-	-	-	S	R	T	S	G	G	I	T	S	S	L	S
E	F	D	Q	G	S	S	E	K	I	Q	K	L	K	I	A	K
T	S	I	P	S	G	G	N	I	G	Y	A	R	L	A	A	S
T	S	I	P	S	G	G	N	I	G	Y	A	R	L	A	A	S
T	A	A	S	F	S	Q	T	V	S	A	V	C	L	P	S	A
S	T	P	V	N	L	L	K	V	T	V	P	I	V	S	R	A
S	T	P	V	N	L	L	K	V	T	V	P	I	V	S	R	A
N	T	P	D	R	L	Q	Q	A	S	L	P	L	S	N	T	N
G	K	D	S	C	Q	G	D	S	G	G	P	I	V	D	S	-
G	-	S	S	C	M	G	D	S	G	G	P	I	V	D	S	-
G	V	S	S	C	M	G	D	S	G	G	P	L	V	C	K	K
G	V	Y	A	S	V	G	A	L	R	S	F	I	D	T	Y	A
G	V	Y	A	S	V	G	A	L	R	S	F	I	D	T	Y	A
G	V	Y	A	R	V	T	A	L	V	N	W	V	Q	Q	T	L

Fig. 3

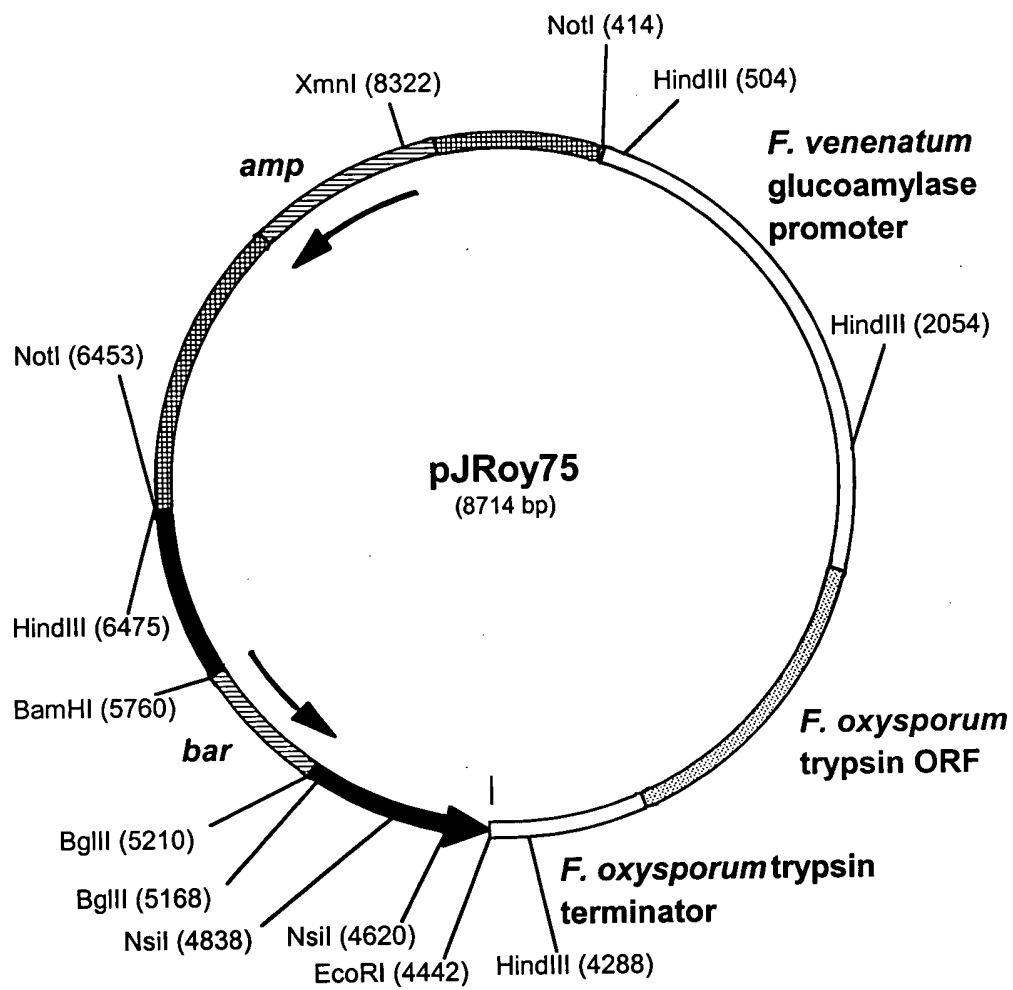


Fig. 4

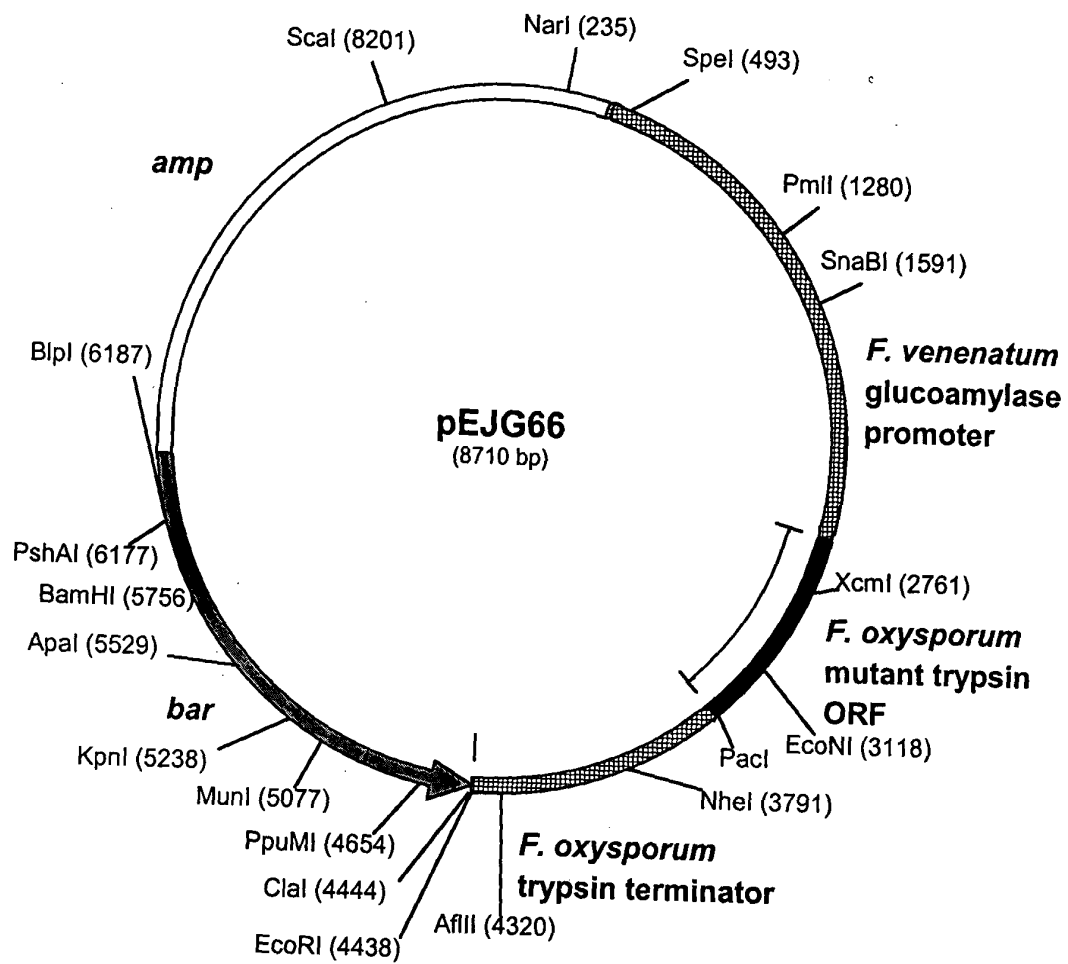


Fig. 5

Peptide Substrate Fingerprinting

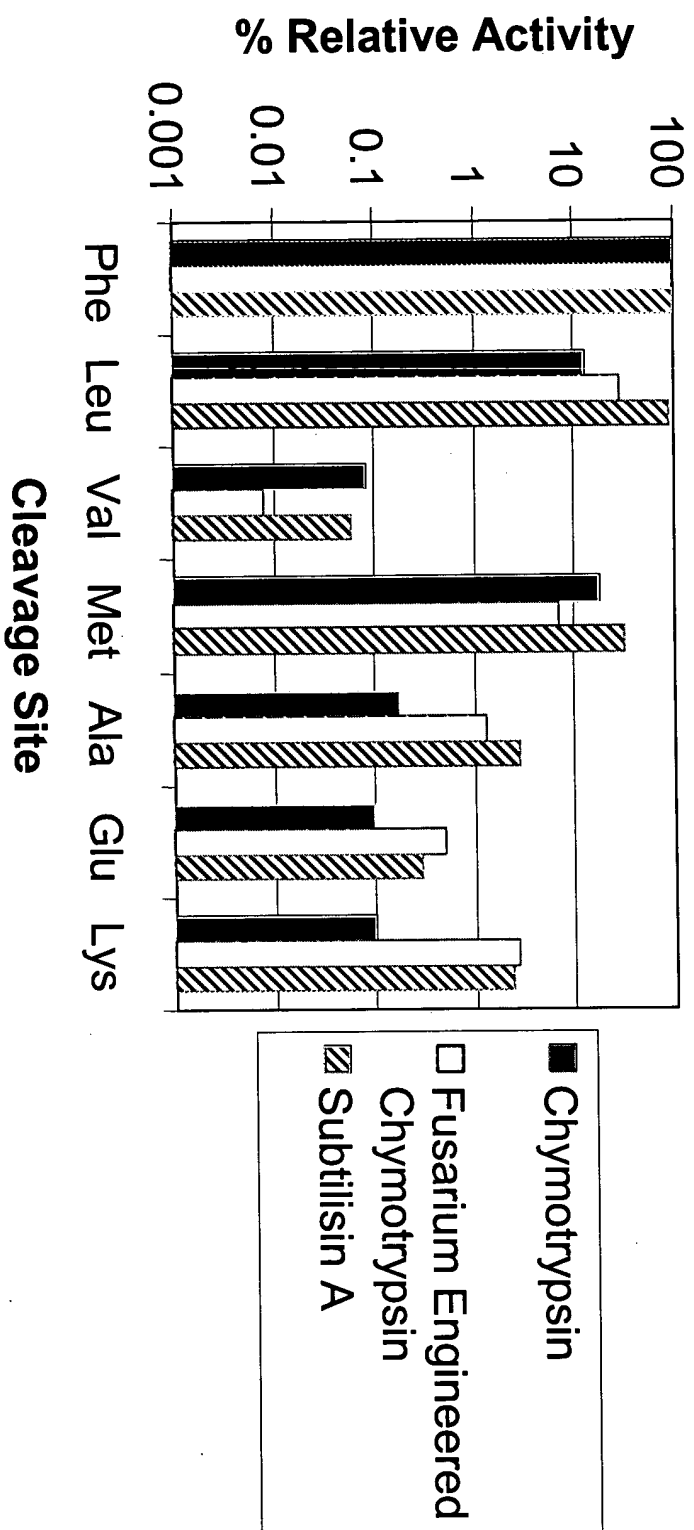


Fig. 6

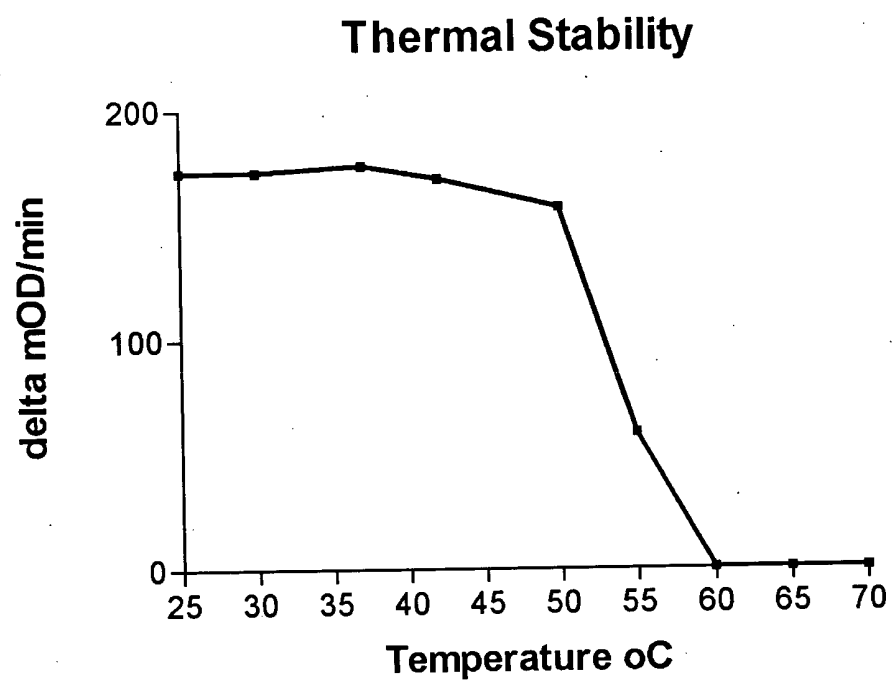


Fig. 7

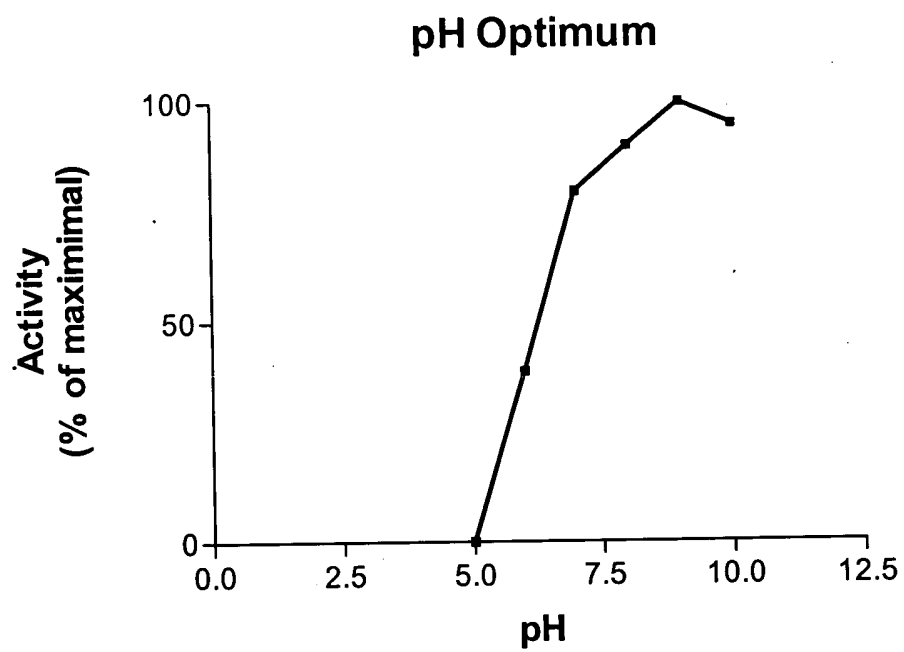


Fig. 8